SG21
REV 3

Small-Signal Plastic Transistors

Selector Guide

MOTOROLA

Contents

TO-92 — Power Dissipation and Package Styles

Devices listed in this Selector Guide will consist of TO-92 packages with three (3) different power dissipation ratings and two (2) different package styles (pinouts).

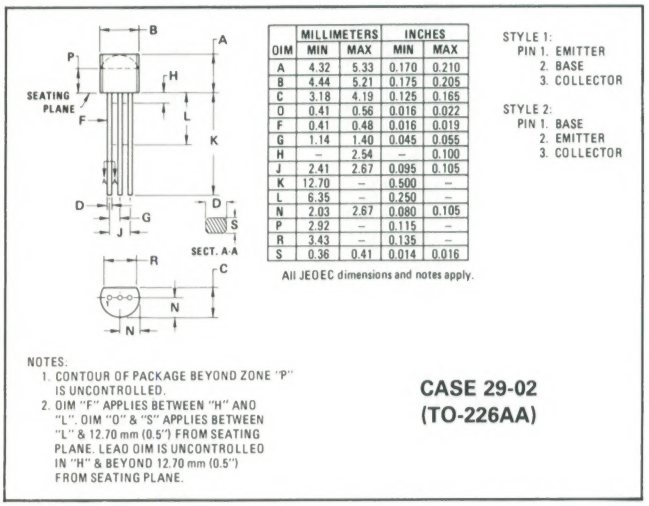
The most prevalent package and style is the Case 29-02 TO-226AA, rated at 625 mW P_D @ T_A = 25°C, with Style 1 (EBC) pinout.

The low power P_D (350 mW) TO-226AA are noted in the table and if the package style is other than Style 1, it is also noted.

All 1 watt TO-92 (TO-226AE) have package Style 1 (EBC pinouts).

Thermal Characteristics

Characteristics	Symbol	Standard Max	Low Power Max	1.0 Watt Max	Units
Thermal (Resistance, Junction to Case)	$R_{\theta JC}$	83.3	125	50	°C/W
Thermal (Resistance Junction to Ambient)	$R_{\theta JA}$	200	357	125	°C/W
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	625 5	350 2.8	1000 8	mW mW/°C
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.5 12	1 8	2.5 20	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J,T_{stg}	−55 to +150	−55 to +150	−55 to +150	°C



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	4.32	5.33	0.170	0.210
B	4.44	5.21	0.175	0.205
C	3.18	4.19	0.125	0.165
D	0.41	0.56	0.016	0.022
F	0.41	0.48	0.016	0.019
G	1.14	1.40	0.045	0.055
H	–	2.54	–	0.100
J	2.41	2.67	0.095	0.105
K	12.70	–	0.500	–
L	6.35	–	0.250	–
N	2.03	2.67	0.080	0.105
P	2.92	–	0.115	–
R	3.43	–	0.135	–
S	0.36	0.41	0.014	0.016

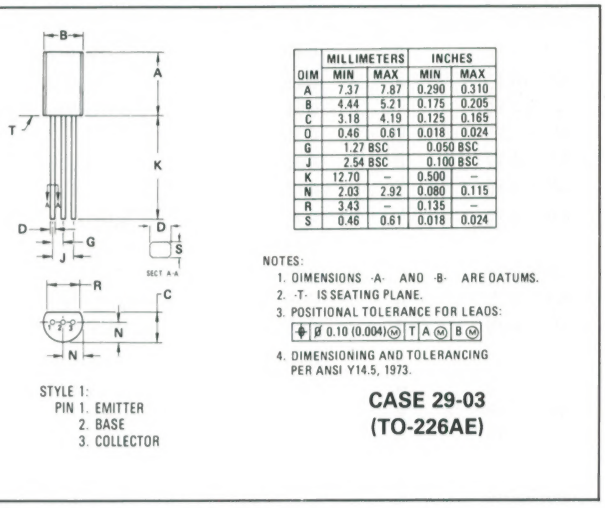
All JEDEC dimensions and notes apply.

STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 2:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

NOTES:
1. CONTOUR OF PACKAGE BEYOND ZONE "P" IS UNCONTROLLED.
2. DIM "F" APPLIES BETWEEN "H" AND "L". DIM "D" & "S" APPLIES BETWEEN "L" & 12.70 mm (0.5") FROM SEATING PLANE. LEAD DIM IS UNCONTROLLED IN "H" & BEYOND 12.70 mm (0.5") FROM SEATING PLANE.

CASE 29-02
(TO-226AA)



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	7.37	7.87	0.290	0.310
B	4.44	5.21	0.175	0.205
C	3.18	4.19	0.125	0.165
D	0.46	0.61	0.018	0.024
G	1.27 BSC		0.050 BSC	
J	2.54 BSC		0.100 BSC	
K	12.70	–	0.500	–
N	2.03	2.92	0.080	0.115
R	3.43	–	0.135	–
S	0.46	0.61	0.018	0.024

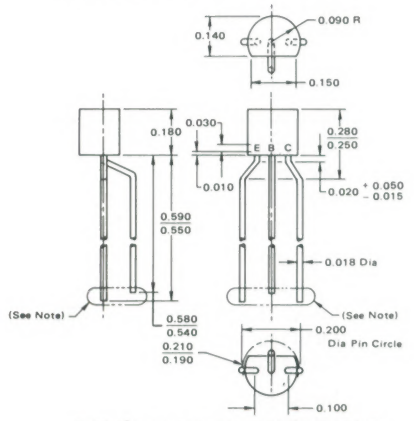
NOTES:
1. DIMENSIONS -A- AND -B- ARE DATUMS.
2. -T- IS SEATING PLANE.
3. POSITIONAL TOLERANCE FOR LEADS:
⌖ Ø 0.10 (0.004) Ⓜ T A Ⓜ B Ⓜ
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.

STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

CASE 29-03
(TO-226AE)

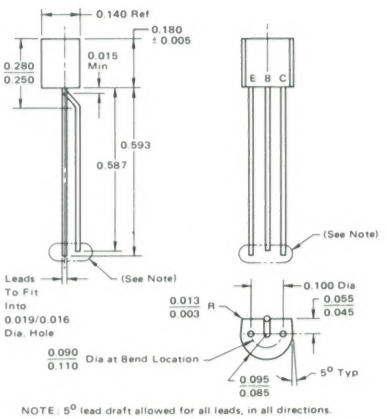
Lead Forms

TO-92 with TO-5 Type Pin Circle



NOTE: 5° lead draft allowed in all directions for all leads.

TO-92 with TO-18 Type Pin Circle



NOTE: 5° lead draft allowed for all leads, in all directions.

Alphanumeric Index

The following table provides an alphanumeric listing of all small-signal plastic transistors currently manufactured by Motorola. Preferred devices — those that merit first consideration for new equipment designs — are fully characterized in subsequent tables within this document, referenced in the table below. Other device types, those not referenced to a specific table, are also available from stock. Detailed specifications for such devices are available from your Motorola sales representative or distributor.

The following table also identifies the various devices by line number. Devices with the same line number, but different type numbers, reflect the distribution of characteristics of a specific transistor design. Thus, where a device is not a "preferred" device, a first approximation of its characteristics may be obtained by checking the characteristics of other devices with the same line number, although the guaranteed specifications can be determined only from the data sheet. A table of devices by line numbers is given on page 6.

Device	Table Number	Line Number	Case Style
MPSA05	1	614	1
MPSA06	1	614	1
MPSA09	5	418	1
MPSA10	—	335	1
MPSA12	4	645	1
MPSA13	4	645	1
MPSA14	4	645	1
MPSA16	8	406	1
MPSA17	8	406	1
MPSA18	5	418	1
MPSA20	1	335	1
MPSA23	—	649	1
MPSA24	—	649	1
MPSA25	4	645	1
MPSA26	4	645	1
MPSA27	4	645	1
MPSA28	4	648	1
MPSA29	4	648	1
MPSA42	6	644	1
MPSA43	6	644	1
MPSA44	6	421	1
MPSA45	6	421	1
MPSA55	1	664	1
MPSA56	1	664	1
MPSA62	4	695	1
MPSA63	4	695	1
MPSA64	4	695	1
MPSA70	1	517	1
MPSA75	4	695	1
MPSA76	4	695	1
MPSA77	4	695	1
MPSA92	6	694	1
MPSA93	6	694	1
MPSD01	6	664	1
MPSD02	—	613	1
MPSD03	—	416	1
MPSD04	4	645	1
MPSD05	—	103	1
MPSD06	—	403	1
MPSD51	6	694	1
MPSD52	—	263	1
MPSD54	4	695	1
MPSD55	—	260	1
MPSD56	—	453	1
MPSH02	—	231	1
MPSH04	3	434	1
MPSH05	3	434	1
MPSH07	3	335	1
MPSH08	3	335	1
MPSH10	3	426	2
MPSH11	3	219	2
MPSH17	3	617	2
MPSH19	—	219	2
MPSH20	3	627	2
MPSH24	3	318	2
MPSH30	3	231	2
MPSH31	—	231	2
MPSH32	3	336	2
MPSH34	3	318	2
MPSH37	—	627	1
MPSH54	3	484	1
MPSH55	3	484	1
MPSH69	3	369	1
MPSH81	3	274	2
MPSL01	6	613	1
MPSL51	6	263	1
MPSW01	7	001	1
MPSW01A	7	001	1
MPSW05	1	014	1
MPSW06	1	014	1
MPSW10	6	044	1
MPSW13	4	045	1
MPSW14	4	045	1
MPSW42	6	044	1
MPSW43	6	044	1
MPSW45	4	045	1
MPSW51	7	051	1
MPSW51A	7	051	1
MPSW55	1	064	1
MPSW56	1	064	1
MPSW60	6	094	1
MPSW63	4	095	1
MPSW64	4	095	1
MPSW92	6	094	1
MPSW93	6	094	1
MPS404	8	255	1
MPS404A	8	255	1
MPS650	7	102	1
MPS651	7	102	1
MPS706	—	73	1
MPS706A	2	73	1
MPS708	—	73	1
MPS750	7	152	1
MPS751	7	152	1
MPS834	—	73	1
MPS835	—	73	1
MPS918	3	75	1
MPS929	—	403	1
MPS929A	—	403	1
MPS930	—	403	1
MPS930A	—	403	1
MPS2222	1	103	1
MPS2222A	—	103	1
MPS2369	2	73	1
MPS2369A	—	73	1
MPS2714	—	73	1
MPS2716	—	221	1
MPS2907	1	261	1
MPS2907A	—	261	1
MPS2923	—	221	1
MPS2924	—	221	1
MPS2925	—	221	1
MPS2926	—	220	1
MPS3013	—	77	1
MPS3390	—	220	1
MPS3391	—	220	1
MPS3391A	—	220	1
MPS3392	—	221	1
MPS3393	—	221	1
MPS3394	—	221	1

Device	Table Number	Line Number	Case Style
MPS3395	—	221	1
MPS3402	—	337	1
MPS3403	—	337	1
MPS3404	—	337	1
MPS3405	—	337	1
MPS3414	—	416	1
MPS3415	—	416	1
MPS3417	—	416	1
MPS3563	3	75	1
MPS3564	—	73	1
MPS3565	—	103	1
MPS3566	—	103	1
MPS3567	—	103	1
MPS3568	—	416	1
MPS3569	—	103	1
MPS3638	—	260	1
MPS3638A	—	260	1
MPS3639	—	345	1
MPS3640	2	345	1
MPS3646	2	77	1
MPS3693	3	235	1
MPS3694	3	235	1
MPS3702	1	260	1
MPS3703	—	260	1
MPS3704	1	103	1
MPS3705	—	103	1
MPS3706	—	103	1
MPS3707	—	335	1
MPS3710	—	335	1
MPS3711	—	335	1
MPS3826	—	221	1
MPS3827	—	221	1
MPS3866	3	619	1
MPS3866A	—	619	1
MPS3903	—	403	1
MPS3904	—	403	1
MPS3905	—	453	1
MPS3906	—	453	1
MPS4123	1	335	1
MPS4124	1	335	1
MPS4125	1	517	1
MPS4126	1	517	1
MPS4248	—	453	1
MPS4249	5	453	1
MPS4250	5	453	1
MPS4250A	5	453	1
MPS4257	—	345	1
MPS4258	2	345	1
MPS4274	—	73	1
MPS4275	—	73	1
MPS4354	—	664	1
MPS4355	—	664	1
MPS4356	—	664	1
MPS4888	—	263	1
MPS4889	—	263	1
MPS5128	—	77	1
MPS5129	—	77	1

Device	Table Number	Line Number	Case Style
MPS5131	—	221	1
MPS5132	—	221	1
MPS5133	—	335	1
MPS5134	—	73	1
MPS5135	—	613	1
MPS5136	—	103	1
MPS5137	—	103	1
MPS5138	—	453	1
MPS5139	—	271	1
MPS5142	—	260	1
MPS5143	—	260	1
MPS5172	1	335	1
MPS5179	3	620	1
MPS5771	2	345	1
MPS5855	—	664	1
MPS5856	—	614	1
MPS5857	—	664	1
MPS5858	—	614	1
MPS6172	—	453	1
MPS6507	—	75	2
MPS6511	—	75	2
MPS6512	—	221	1
MPS6513	1	221	1
MPS6514	1	221	1
MPS6515	1	221	1
MPS6516	—	271	1
MPS6517	1	271	1
MPS6518	1	271	1
MPS6519	1	271	1
MPS6520	5	403	1
MPS6521	5	403	1
MPS6522	5	453	1
MPS6523	5	453	1
MPS6530	—	103	1
MPS6531	1	103	1
MPS6532	—	103	1
MPS6533	—	260	1
MPS6534	1	260	1
MPS6535	—	260	1
MPS6539	3	426	1
MPS6540	3	627	2
MPS6541	—	75	2
MPS6543	3	229	2
MPS6544	—	627	2
MPS6545	—	627	2
MPS6546	—	229	2
MPS6547	3	229	1
MPS6548	—	426	1
MPS6560	7	601	1
MPS6561	—	601	1
MPS6562	7	664	1
MPS6563	—	664	1
MPS6565	—	221	1
MPS6566	—	220	1
MPS6567	—	627	2
MPS6568	—	231	1
MPS6568A	—	231	1

Device	Table Number	Line Number	Case Style
MPS6569	—	231	1
MPS6569A	—	231	1
MPS6570	—	231	1
MPS6570A	—	231	1
MPS6571	—	418	1
MPS6573	—	335	1
MPS6574	—	335	1
MPS6575	—	335	1
MPS6595	—	618	1
MPS6601	7	601	1
MPS6602	7	601	1
MPS6651	7	651	1
MPS6652	7	651	1
MPS6714	7	001	1
MPS6715	7	001	1
MPS6716	1	014	1
MPS6717	1	014	1
MPS6724	4	045	1
MPS6725	4	045	1
MPS6726	7	051	1
MPS6727	7	051	1
MPS6728	1	064	1
MPS6729	1	064	1
MPS6733	6	044	1
MPS6734	6	044	1
MPS6735	6	044	1
MPS6652	7	311	1
MPS901	3	300	1
MPS571	3	132	1
MPS911	3	104	1
MPS536	3	327	1
MPS8000	—	614	1
MPS8001	—	75	2
MPS8092	—	103	1
MPS8093	—	260	1
MPS8097	5	418	1
MPS8098	1	416	1
MPS8099	1	416	1
MPS8598	1	466	1
MPS8599	1	466	1
PN2222	—	103	1
PN2222A	—	103	1
PN2907	—	261	1
PN2907A	—	261	1
2N3903	1	221	1
2N3904	1	221	1
2N3905	1	271	1
2N3906	1	271	1
2N4123	1 & 5	221	1
2N4124	1 & 5	221	1
2N4125	1 & 5	271	1
2N4126	1 & 5	271	1
2N4264	2	77	1
2N4265	2	77	1
2N4400	1	103	1
2N4401	1	103	1
2N4402	1	260	1

ALPHANUMERIC INDEX (continued)

Device	Table Number	Line Number	Case Style
2N4403	1	260	1
2N4409	—	613	1
2N4410	—	613	1
2N5086	—	453	1
2N5087	5	453	1
2N5088	5	418	1
2N5089	5	418	1
2N5209	5	418	1
2N5210	5	335	1
2N5219	—	221	1
2N5220	—	103	1
2N5221	—	261	1
2N5222	3	426	2

Device	Table Number	Line Number	Case Style
2N5223	—	221	1
2N5224	—	73	1
2N5225	—	103	1
2N5226	—	260	1
2N5227	—	271	1
2N5228	—	345	1
2N5400	6	263	1
2N5401	6	263	1
2N5550	6	613	1
2N5551	6	613	1
2N5771	2	345	1
2N5772	—	77	1
2N6426	4	645	1

Device	Table Number	Line Number	Case Style
2N6427	4	645	1
2N6428	5	418	1
2N6428A	5	418	1
2N6429	5	418	1
2N6429A	5	418	1
2N6515	6	644	1
2N6516	6	644	1
2N6517	6	644	1
2N6518	6	694	1
2N6519	6	694	1
2N6520	6	694	1

Line Source Cross-Reference

Motorola manufactures silicon plastic transistors in a number of families, or lines. Each line has a specific chip type, geometry, metallization and package type. The various 2N, MPS and special device types are sorted to their respective electrical specifications from the distribution of this line.

The following section is a line number cross-reference list. It is useful in obtaining devices similar to a given transistor type. With it you can obtain the device number of similar units with slightly relaxed specs or perhaps slightly more rigid electrical specifications. Often it is possible to find a device with a slight variation in electrical specifications which better suits your needs.

Line Number	Standard Devices	Description
1	MPS6714 MPS6715 MPSW01 MPSW01A	NPN High Current 1 Watt
14	MPS6716 MPS6717 MPSW05 MPSW06	NPN General Purpose 1 Watt
44	MPS6733 MPS6734 MPS6735 MPSW10 MPSW42 MPSW43	NPN High Voltage 1 Watt
45	MPS6724 MPS6725 MPSW13 MPSW14 MPSW45	NPN Darlington 1 Watt
51	MPS6726 MPS6727 MPSW51 MPSW51A	PNP High Current 1 Watt
64	MPS6728 MPS6729 MPSW55 MPSW56	PNP General Purpose 1 Watt

Line Number	Standard Devices	Description
73	MPS706 MPS706A MPS708 MPS834 MPS835 MPS2369 MPS2369A MPS2714 MPS3564 MPS4274 MPS4275 MPS5134 2N5224	NPN General Purpose Switch
75	MPS918 MPS3563 MPS6507 MPS6511 MPS6541 MPS8001	NPN Oscillator and Mixer
77	MPS3013 MPS3646 MPS5128 MPS5129 2N4264 2N4265 2N5772	NPN General Purpose Switch
94	MPSW60 MPSW92 MPSW93	PNP High Voltage 1 Watt

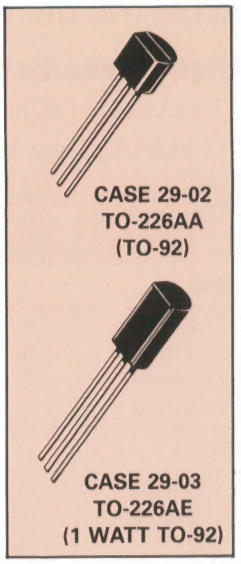
Line Number	Standard Devices	Description
95	MPSW63 MPSW64	PNP Darlington 1 Watt
102	MPS650 MPS651	NPN High Current
103	MPSD05 MPS2222 MPS2222A MPS3565 MPS3566 MPS3567 MPS3569 MPS3704 MPS3705 MPS3706 MPS5136 MPS5137 MPS6530 MPS6531 MPS6532 MPS8092 PN2222 PN2222A 2N4400 2N4401 2N5220 2N5225	NPN General Purpose Amplifier/Switch
152	MPS750 MPS751	PNP High Current
219	MPSH11 MPSH19	NPN RF Amplifier
220	MPS2926 MPS3390 MPS3391 MPS3391A MPS6512 MPS6515	NPN General Purpose Amplifier/Switch
221	MPS2716 MPS2923 MPS2924 MPS2925 MPS3392 MPS3393 MPS3394 MPS3395 MPS3826 MPS3827 MPS5131 MPS5132 MPS6512 MPS6513 MPS6514 2N3903 2N3904 2N4123 2N4124 2N5219 2N5223	NPN General Purpose Amplifier/Switch
229	MPS6543 MPS6546 MPS6547	NPN RF — Oscillator and Mixer
231	MPSH02 MPSH30 MPSH31 MPS6568 MPS6568A MPS6569 MPS6569A MPS6570 MPS6570A	NPN RF/IF Amplifier
235	MPS3693 MPS3694	NPN RF Amplifier
242	MPSA44 MPSA45	NPN High Voltage

Line Number	Standard Devices	Description
255	MPS404 MPS404A	PNP Chopper
260	MPSD55 MPS3638 MPS3638A MPS3702 MPS3703 MPS5142 MPS5143 MPS6533 MPS6634 MPS6535 MPS8093 2N4402 2N4403 2N5226	PNP General Purpose Amplifier/Switch
261	MPS2907 MPS2907A PN2907 PN2907A 2N5221	PNP General Purpose Amplifier/Switch
263	MPSD52 MPSL51 MPS4888 MPS4889 2N5400 2N5401	PNP High Voltage General Purpose
271	MPS5139 MPS6516 MPS6517 MPS6518 MPS6519 2N3905 2N3906 2N4125 2N4126 2N5227	PNP General Purpose Amplifier/Switch
274	MPSH81	PNP RF — UHF/VHF Oscillator
318	MPSH24 MPSH34	NPN RF Mixer
335	MPSA20 MPSH07 MPSH08 MPS4123 MPS4124 MPS5172 2N5210	NPN General Purpose
336	MPSH32	NPN RF Amplifier
337	MPS3402 MPS3403 MPS3404 MPS3405	NPN General Purpose Amplifier
345	MPS3639 MPS3640 MPS4257 MPS4258 MPS5771 2N5228 2N5771	PNP Switch
369	MPSH69	PNP RF — Oscillator/ Mixer
403	MPSA10 MPSD06 MPS929 MPS929A MPS930 MPS930A MPS3707 MPS3710 MPS3711 MPS3903	NPN General Purpose Amplifier

Line Number	Standard Devices	Description
	MPS3904 MPS5133 MPS6513 MPS6520 MPS6521 MPS6573 MPS6574	
406	MPSA16 MPSA17	NPN Chopper
416	MPSD03 MPS3414 MPS3415 MPS3417 MPS3568 MPS8098 MPS8099	NPN General Purpose Amplifier
418	MPSA09 MPSA18 MPS6571 MPS8097 2N5088 2N5089 2N5209 2N6428 2N6428A 2N6429 2N6429A	NPN Low Noise
426	MPSH10 MPS6539 MPS6548 2N5222	NPN RF — Oscillator/ Mixer
434	MPSH04 MPSH05	NPN RF Amplifier
453	MPSD56 MPS3905 MPS3906 MPS4248 MPS4249 MPS4250 MPS4250A MPS5138 MPS6172 MPS6522 MPS6523 2N5086 2N5087	PNP General Purpose Amplifier
466	MPS8598 MPS8599	PNP General Purpose Amplifier
484	MPSH54 MPSH55	PNP RF Amplifier
517	MPSA70 MPS4125 MPS4126	PNP General Purpose Amplifier
601	MPS6560 MPS6561 MPS6601 MPS6602	NPN High-Current
613	MPSD02 MPSL01 MPS5135 2N4409 2N4410 2N5550 2N5551	NPN High Voltage General Purpose

Line Number	Standard Devices	Description
614	MPSA05 MPSA06 MPS5856 MPS5858 MPS8000	NPN General Purpose
617	MPSH17	NPN RF Amplifier
618	MPS6595	NPN High-Speed Switch
619	MPS3866 MPS3866A	NPN RF Amplifier
620	MPS5179	NPN RF
627	MPSH20 MPSH37 MPS6540 MPS6544 MPS6545 MPS6567	NPN RF Amplifier/Mixer
644	MPSA42 MPSA43 MPSD01 2N6515 2N6516 2N6517	NPN High Voltage
645	MPSA12 MPSA13 MPSA14 MPSA25 MPSA26 MPSA27 MPSD04 2N6426 2N6427	NPN Darlington
648	MPSA28 MPSA29	NPN Darlington
651	MPS6651 MPS6652	PNP High Current Amplifier
662	MPS6562 MPS6563	PNP General Purpose Amplifier
664	MPSA55 MPSA56 MPS4354 MPS4355 MPS4356 MPS5855 MPS5857	PNP General Purpose Amplifier
694	MPSA92 MPSA93 MPSD51 2N6518 2N6519 2N6520	PNP High Voltage
695	MPSA62 MPSA63 MPSA64 MPSA75 MPSA76 MPSA77 MPSD54	PNP Darlington
8100	MPS901	NPN RF-Oscillator/Mixer
8104	MPS911	NPN RF-Oscillator/Mixer
8132	MPS571	NPN RF-Oscillator/Mixer
8327	MPS536	PNP RF-Oscillator/Mixer

Selector Guide
Preferred Small-Signal Transistors



Due to process variations, it is often difficult to make a cost-effective device selection, even if all specifications of every family member are clearly listed. The subsequent "preferred devices" selector guide has been developed to simplify the selection problem.

Preferred devices, in this concept, are those whose specifications groupings have proved to be the most popular — resulting in a combination of good performance and low cost. In each of the subsequent tables, the major specifications of these devices are given for easy comparison.

1. *The performance capacity.* Obviously, devices with the highest available breakdown voltage are more expensive than those with lower ratings because there are fewer on a wafer.
2. *The spread of characteristics.* That is, device types with narrow limits on one or more of its critical parameters are more expensive than those with wider limits.
3. *Popularity.* A device specification that is in great demand is less expensive than some other "selection" of limits that may yield as many devices but has a smaller sales potential.

General-Purpose — Table 1

These general-purpose transistors are designed for small-signal amplification from dc to low radio frequencies. They are also useful as oscillators and general-purpose switches. The transistors are listed in order of decreasing breakdown voltage, $V_{(BR)CEO}$.

TO-226AA, Style 1, P_D @ T_A = 25°C = 625 mW

Device and Polarity		$V_{(BR)CEO}$	f_T @		I_C	h_{FE} @		
NPN	PNP	Volts Min	MHz Min	I_C mA	mA Max	Min	Max	I_C mA
MPS8099	MPS8599	80	150	10	200	100	300	1
MPSA06	MPSA56	80	100	10	500	50	—	100
MPS8098	MPS8598	60	150	10	200	100	300	1
MPSA05	MPSA55	60	100	10	500	50	—	100
MPS651	MPS751	60	75	50	2000	40	—	2000
2N3904	2N3906	40	300	10	200	100	300	10
2N4401	2N4403	40	250	20	600	100	300	150
2N3903	2N3905	40	250	10	200	50	150	100
2N4400	2N4402	40	200	20	600	50	150	150
MPSA20	MPSA70	40	125	5	100	40	400	5
MPS650	MPS750	40	75	50	2000	40	—	2000
MPS6531	MPS6534	40	390†	50	600	90	270	100
MPS2222	MPS2907	30	250	20	600	100	300	150
2N4123	2N4125	30	250	10	200	50	150	2
MPS3704	MPS3702	30	100	50	600	100	300	50
MPS6513	MPS6517	30	330†	10	100	90	180	2
MPS4123	MPS4125	30	100/150	10	200	50	200	200
MPS4124	MPS4126	25	170	10	200	120	480	200
2N4124	2N4126	25	300	10	200	120	360	2
MPS6514	MPS6518	25	480†	10	100	150	300	2
MPS6515	MPS6519	25	480	10	100	250	500	2
MPS5172		25	120	5	100	100	500	10
MPS6560	MPS6562	25	60	10	500	50	200	600
MPS6601	MPS6651	25	100	50	1000	30	150	1000

TO-226AE, Style 1, 1 Watt TO-92, P_D @ T_A = 25°C = 1 W

MPS6717	MPS6729	80	50	200	500	80	—	50
MPSW06	MPSW56	80	50	200	500	80	—	50
MPS6716	MPS6728	60	50	200	500	80	—	50
MPSW05	MPSW55	60	50	200	500	80	—	50
MPS6715	MPS6727	40	50	50	1000	50	—	1000
MPSW01A	MPSW51A	40	50	50	1000	50	—	1000
MPS6714	MPS6726	30	50	50	1000	50	—	1000
MPSW01	MPSW51	30	50	50	1000	50	—	1000

†Typ

SELECTOR GUIDE (continued)

High-Speed Saturated Switching — Table 2

Devices are listed in order of decreasing turn-on time (t_{on}).

TO-226AA, Style 1, P_D @ T_A = 25°C = 625 mW

Device	t_{on} & t_{off} @ ns Max	ns Max	I_C mA	$V_{(BR)CEO}$ Volts Min	h_{FE} @ Min	I_C mA	$V_{CE(sat)}$ @ Volts Max	I_C mA	& I_B mA	f_T @ MHz Min	I_C mA
NPN											
2N4264	25	35	10	15	40	10	0.22	10	1	300	10
2N4265	25	35	10	12	100	10	0.22	10	1	300	10
MPS3646	18	28	300	15	30	30	0.20	30	3	350	30
MPS2369	12	18	10	15	40	10	0.25	10	1	500	10
PNP											
MPS3640	25	35	50	12	30	10	0.20	10	1	500	10
MPS4258	15	20	10	12	30	50	0.15	10	1	700	10
2N5771	15	20	10	15	50	10	0.18	10	1	850	10
MPS5771	15	25	10	15	50	10	0.18	10	1	850	10

RF/UHF/VHF Amplifiers and CATV — Table 3

These transistors are high performance, high frequency standard devices listed in order of decreasing f_T min.

TO-226AA, Styles 1 and 2

Device	f_T MHz @ I_C mA			C_{cb} pF Max	$V_{(BR)CEO}$ Volts Min	G_{pe} dB Min	NF dB @ f MHz		V_{AGC} @ Min	Gain Reduction dB	P_D@ 25°C	Case Style
	Min	Typ					Max					
NPN												
MPS571		6000	30	1	10	12†	2†	1000			625	2
MPS911		5000	30	1	12	12.5	2.50†	1000			625	2
MPS901		4500	15	1	15	12	2.50†	900			625	2
MPS5179	900		5	1	12	15	4.50	200			625	1
MPSH17	800	1600	5	0.90	15	24†	6	200			625	2
MPS6543	750	1100	4	1	25						350	2
MPSH10	650	1500	4	0.65*	25						350	2
MPSH11	650	1400	4	0.70	25						350	2
MPS6547	600	1100	2	0.35†	25						625	1
MPS918	600	800	4	1.70	15	15	6	60			625	1
MPS3563	600	800	8	1.70	12	14					625	1
MPS3866	500		50		30	10					625	1
MPSH08	400	700	3	0.30*	30	14	3.50	200	5**	30	350	1
MPSH34	500	700	15	0.32	45						350	2
MPS6539	500	1000	4	0.70	20		4.50	100			350	2
2N5222	450	1000	4	1.30	15						350	2
MPSH07	400	700	3	0.30*	30	18	3.20	100	5	30	350	1
MPSH24	400	800	8	0.36	30						350	2
MPSH20	400	750	4	0.65	30						350	2
MPS6540	350	700	2	0.65	30						350	2
MPSH32	300	450	4	0.22	30	22.5	3.30†	45	5.50†	30	625	2
MPSH30	300	450	4	0.65	20	22.5	6	45	4.40	30	625	2
MPS3693	200	400	10	3.50	45		4†	1			350	1
MPS3694	200	400	10	3.50	45		4†	1			350	1
MPSH04	80	120	1.50	1.60	80		2	1			625	1
MPSH05	80	120	1.50	1.60	80		2	1			625	1
PNP												
MPS536		6000	20	1.30	10	10†	3†	500			625	2
MPSH81	600	700	5	0.65*	20						350	2
MPSH54	80	130	1.50	1.60	80		2	1			625	1
MPSH55	80	130	1.50	1.60	80						625	1
MPSH69	2		10	0.30††	15						625	1

*C_{ce} **|AGC †Typ ††C_{RB}

Darlington — Table 4

Darlington amplifiers are cascade transistors used in applications requiring very high gain and input impedance. These devices have monolithic construction and are listed in order of decreasing voltage, $V_{(BR)CES}$.

TO-226AA, Style 1, P_D @ T_A = 25°C = 625 mW

Device and Polarity		$V_{(BR)CES}$	@		I_C	f_T @		$V_{CE(sat)}$ @		
NPN	PNP	Volts Min	h_{FE} Min	I_C mA	mA Max	MHz Min	I_C mA	Volts Max	I_C mA	I_B mA
MPSA29		100	10000	100	500	125	10	2	100	0.10
MPSA28		80	10000	100	500	125	10	2	100	0.10
MPSA27		60	10000	100	500	125	10	1.50	100	0.10
	MPSA77	60	10000	100	300	125	10	1.50	100	0.10
MPSA26		50	10000	100	500	125	10	1.50	100	0.10
	MPSA76	50	10000	100	300	125	10	1.50	100	0.10
2N6426		40	30000	100	500	150	10	1.50	500	0.50
2N6427		40	20000	100	500	130	10	1.50	500	0.50
MPSA25		40	10000	100	500	125	10	1.50	100	0.10
	MPSA75	40	10000	100	300	125	10	1.50	100	0.10
MPSA14	MPSA64	30	20000	100	300	125	10	1.50	100	0.10
MPSA13	MPSA63	30	10000	100	300	125	10	1.50	100	0.10
MPSD04	MPSD54	25	1000	100	300	100	10	1	100	0.10
MPSA12	MPSA62	20	20000	10	300			1	10	0.01

TO-226AE, Style 1, 1 Watt TO-92, P_D @ T_A = 25°C = 1 W

MPS6725		50	25K	200	1000	100	200	1.50	1000	2
MPS6724		40	25K	200	1000	100	200	1.50	1000	2
MPSW45		40	25K	200	1000	100	200	1.50	1000	2
MPSW14	MPSW64	3	20K	100	1000	125	10	1.50	100	0.10
MPSW13	MPSW63	30	10K	100	1000	125	10	1.50	100	0.10

Low-Noise Amplifier — Table 5

Listed in decreasing order of noise figure (NF).

TO-226AA, Style 1

Device	NF @ dB Typ	r	$V_{(BR)CEO}$ Volts Min	@ h_{FE} Min	I_C mA	f_T @ MHz Min	I_C mA	P_D@ 25°C
NPN								
2N6428	6	Audio	50	250	10	100	1	625
2N4123	6*	Audio	30	50	2	250	10	350
2N6429	5	Audio	45	500	10	100	1.0	625
2N4124	5*	Audio	25	120	2	300	10	350
2N6428A	4**	Audio	50	250	10	100	1	625
2N6429A	3.50**	Audio	45	500	10	100	1	625
2N5209	3**	Audio	50	150	10	30	0.50	350
2N5088	3	Audio	30	300	10	50	0.50	350
MPS6520	3	Audio	25	200	2	390†	2	625
MPS6521	3	Audio	25	300	2	390†	2	625
2N5210	2**	Audio	50	250	10	30	0.50	350
MPS8097	2**	Audio	40	250	0.10	200	10	625
2N5089	2**	Audio	25	400	10	50	0.50	350
MPSA18	1.50**	Audio	45	500	10	100	1	625
MPSA09	1.40	1 kHz	50	100	0.10	30	0.50	625
PNP								
2N4125	5*	Audio	30	50	2	200	10	625
2N4126	4*	Audio	25	120	2	250	10	625
2N5086	3	Audio	50	150	10	40	0.50	350
MPS6522	3	Audio	25	200	2	340†	2	625
MPS6523	3	Audio	25	300	2	340†	2	625
MPS4249	3	1 kHz	60	100	10	100	1	200
2N5087	2	Audio	60	250	10	40	0.50	350
MPS4250	2	1 kHz	40	250	10	250	1	200
MPS4250A	2	1 kHz	60	250	0.10	250	1	200

*Audio = 10 Hz to 15.7 kHz. **Max †Typ

High-Voltage — Table 6

These high-voltage transistors are designed for driving neon bulbs and Nixie® indicator tubes, for direct line operation, and for other applications requiring high-voltage capability at relatively low collector current. Devices are listed in order of decreasing breakdown voltage, $V_{(BR)CEO}$.

TO-226AA, Style 1, P_D @ T_A = 25°C = 625 mW

Device	$V_{(BR)CEO}$ Volts Min	I_C mA Max	@ h_{FE} Min	@ I_C mA	$V_{CE(sat)}$ Volts Max	& I_C mA	& I_B mA	f_T @ MHz Min	@ I_C mA
NPN									
MPSA44	400	300	40	100	0.75	50	5	20	10
2N6517	350	500	30	30	0.30	10	1	40	10
MPSA45	350	300	40	100	0.75	50	5	20	10
2N6516	300	500	45	30	0.30	10	1	40	10
MPSA42	300	500	40	10	0.50	20	2	50	10
2N6515	250	500	50	30	0.30	10	1	40	10
MPSA43	200	500	40	10	0.40	20	2	50	10
MPSD01	200	100	20	30				40	10
2N5551	160	600	80	10	0.15	10	1	100	10
2N5550	140	600	60	10	0.15	10	1	100	10
MPSL01	120	150	50	10				60	10
TO-226AE, Style 1, 1 Watt TO-92, P_D @ T_A = 25°C = 1 W									
MPS6735	300	300	40	10	2	20	2	50	10
MPSW10	300	300	40	30	0.75	30	3	45	10
MPSW42	300	300	40	30	0.50	20	2	50	10
MPS6734	250	300	40	10	2	20	2	50	10
MPSW43	200	300	50	30	0.40	20	2	50	10
MPS6733	200	300	40	10	2	20	2	50	10
PNP									
2N6520	350	500	30	30	0.30	10	1	40	10
2N6519	300	500	45	30	0.30	10	1	40	10
MPSA92	300	500	40	10	0.80	20	2	50	10
2N6518	250	500	50	30	0.30	10	1	40	10
MPSA93	200	500	40	10	0.70	20	2	50	10
MPSD51	200	100	20	30				40	10
2N5401	150	600	60	10	0.50	50	0.50	100	10
2N5400	120	600	40	10	0.50	50	0.50	100	10
MPSL51	100	600	40	50	0.25	10	1	60	10
TO-226AE, Style 1, 1 Watt TO-92, P_D @ T_A = 25°C = 1 W									
MPSW60	300	300	40	30	0.75	20	2	60	10
MPSW92	300	300	25	30	0.50	20	2	50	10
MPSW93	200	300	30	30	0.40	20	2	50	10

*Registered trademark of Burroughs Corporation.

High-Current — Table 7

These high-current transistors are designed for use in many consumer and industrial applications that require high speed power switching, such as lamp and solenoid drivers, audio amplifiers and complementary drivers for hi-fi amplifiers.

TO-226AA, Style 1, P_D @ T_A = 25°C = 350 mW

Device and Polarity		$V_{(BR)CEO}$ Volts Min	@		I_C mA Max	f_T @		$V_{CE(sat)}$ @		
NPN	PNP		h_{FE} Min	I_C mA		MHz Min	I_C mA	Volts Max	I_C mA	I_B mA
MPS650	MPS750	40	40	2000	2	75	50	0.50	2000	200
MPS651	MPS751	60	40	2000	2	75	50	0.50	2000	200
MPS6560	MPS6562	25	50	500	500	60	10	0.50	500	50
MPS6601	MPS6651	25	30	1000	1000	100	50	0.60	1000	100
MPS6602	MPS6652	40	30	1000	1000	100	50	0.60	1000	100

TO-226AE, Style 1, 1 Watt TO-92, P_D @ T_A = 25°C = 1 W

MPS6715	MPS6727	40	50	1000	1000	50	50	0.50	1000	100
MPSW01A	MPSW51A	40	50	1000	1000	50	50	0.70	1000	100
MPS6714	MPS6726	30	50	1000	1000	50	50	0.50	1000	100
MPSW01	MPSW51	30	50	1000	1000	50	50	0.70	1000	100

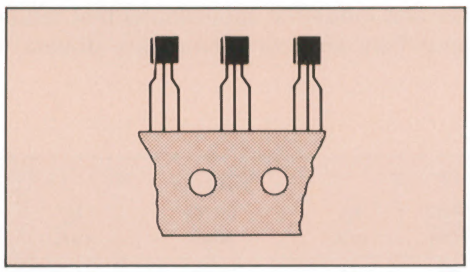
Choppers — Table 8

Devices are listed in decreasing $V_{(BR)EBO}$.

TO-226AA, Style 1, P_D @ T_A = 25°C = 625 mW

Device	$V_{(BR)EBO}$ Volts Min	I_C mA Max	@		$V_{CE(sat)}$ Volts Max	&		f_T @	
			h_{FE} Min	I_C mA		I_C mA	I_B mA	MHz Min	I_C mA
NPN									
MPSA17	15	100	200	5	0.25	10	1	100	5
MPSA16	12	100	200	5	0.25	10	1	80	5
PNP									
MPS404A	25	150	30	12	0.20	24	1	—	—
MPS404	12	150	30	12	0.20	24	1	—	—

Radial Tape and Reel/Ammo Pack



Radial tape and reel of the reliable TO-92 package is the best method of capturing devices for automatic insertion in printed circuit boards. This method of taping is compatible with various equipment for active and passive component insertion.

- Available on 365 mm Reels
- Accommodates Various Inserters
- Available in Ammo Pack (Fan Fold Box)
- Allows Flexible Circuit Board Layout
- 2.5 mm Pin Spacing For Soldering
- Conforms to EIA ACP Standard 1375 (RS-468)*

Ordering Information:

When ordering radial tape on reel or in ammo pack, specify the style. Add the suffix "RLR" and the "Style" to the device title, i.e. MPS3904RLRA. This will be a standard MPS3904 radial taped and supplied on a reel, Style A.

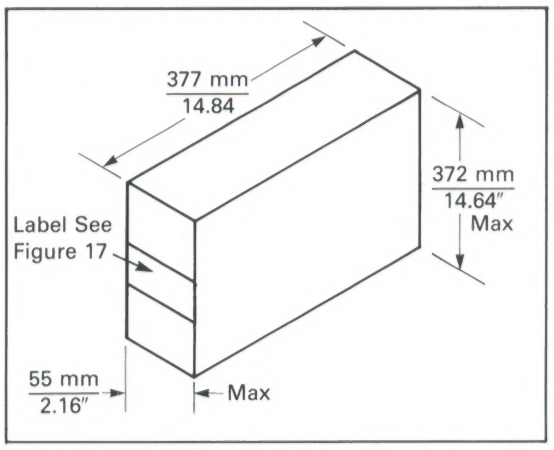
Reel Information — Minimum order quantity 8000. Order in increments of 2000.

Ammo Pack Information — Minimum order quantity 9000. Order in increments of 3000.

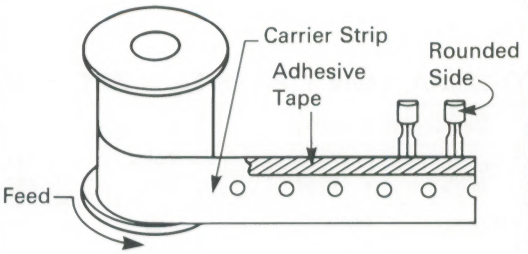
*EIA ACP reel diameter 360 mm. Motorola is 365 mm.

Note: Reference TO-92 Radial Tape Reel/Ammo Pack, DS3563R1 for complete specifications.

AMMO PACK DIMENSIONS

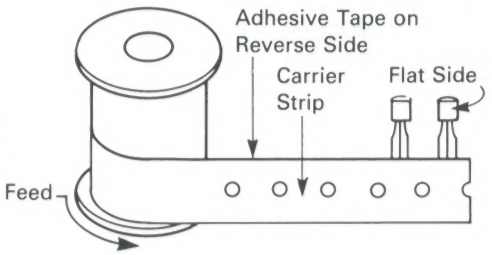


STYLE A



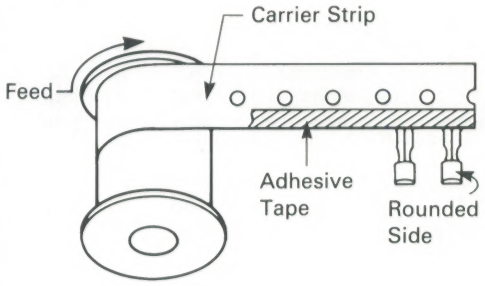
Rounded side of transistor and adhesive tape visible.

STYLE B



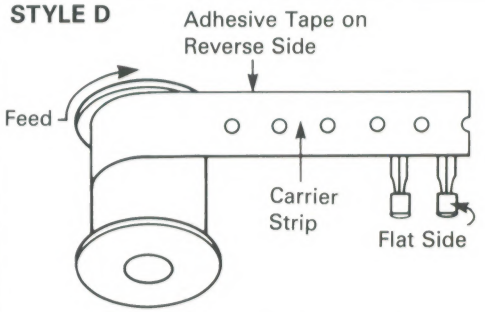
Flat side of transistor and carrier strip visible (adhesive tape on reverse side).

STYLE C



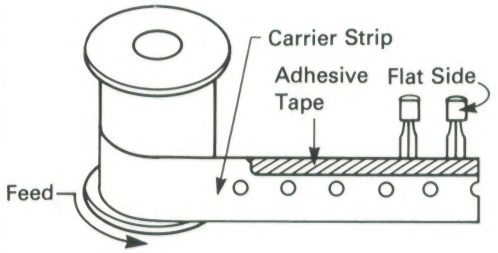
Rounded side of transistor and adhesive tape visible.

STYLE D



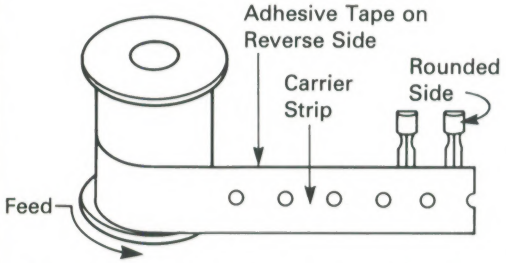
Flat side of transistor and carrier strip visible (adhesive tape on reverse side).

STYLE E



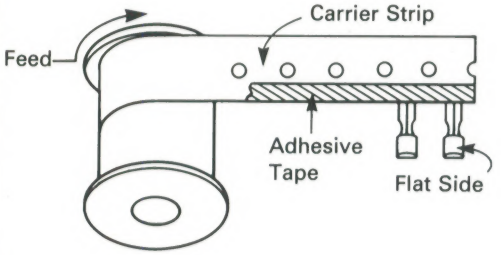
Flat side of transistor and adhesive tape visible.

STYLE F



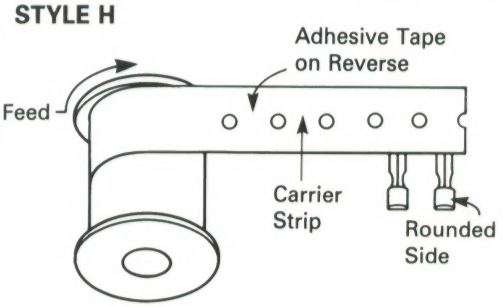
Rounded side of transistor and carrier strip visible (adhesive tape on reverse side).

STYLE G



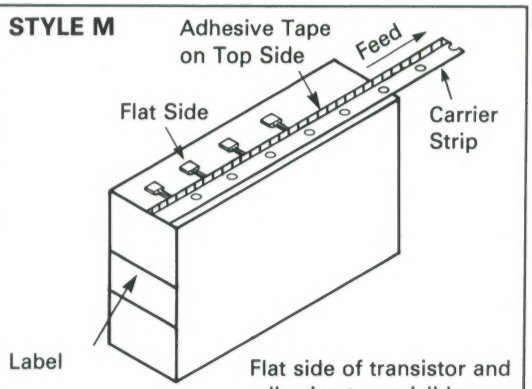
Flat side of transistor and adhesive tape visible.

STYLE H



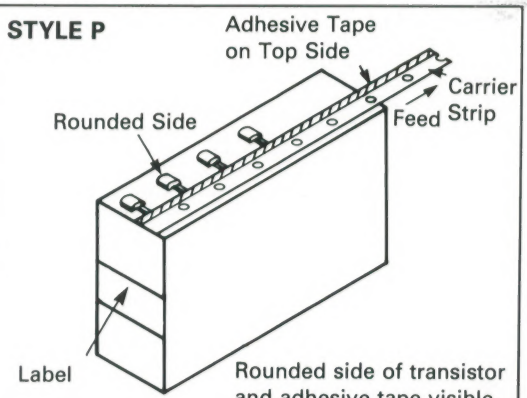
Rounded side of transistor and carrier strip visible (adhesive tape on reverse side).

STYLE M



Style M ammo pack is equivalent to styles E, F, G, H of reel pack dependent on feed orientation from box.

STYLE P



Style P ammo pack is equivalent to styles A, B, C, D of reel pack dependent on feed orientation from box.

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